

CLAIMS

What is claimed is:

5        1. A method for guaranteeing an upper bound on output jitter while maintaining maximum loop bandwidth, said method comprising the steps of:

receiving a plurality of transport packets wherein each of at least a portion of said plurality of transport packets includes a first timestamp value therein;

generating a stream of said first timestamp values;

10      generating a variable rate timing signal stream conveying the average rate of said first timestamp values; and

generating a stable rate timing signal stream conveying the average rate of said variable rate timing signal stream.

15      2. The method of Claim 1 further comprising the step of releasing said transport packets from a buffer responsive to said stable rate timing signal stream.

20      3. The method of Claim 1 wherein said step of generating a variable rate timing signal stream is responsive to a variation rate and a phase accumulation rate of said stream of said first timestamp values.

25      4. The method of Claim 3 wherein said step of generating a stable rate timing signal stream is responsive to said phase accumulation rate of said stream of said first timestamp values.

5. The method of Claim 4 wherein said step of generating a stable rate timing signal stream is responsive to feeding forward said phase accumulation rate of said stream of said first timestamp values.

6. The method of Claim 5 further comprising the step of limiting the rate of change of said phase accumulation rate of said stable rate timing signal stream as a result of feeding forward said phase accumulation rate of said stream of said first timestamp values.

5

7. The method of Claim 5 further comprising the step of slew rate limiting said feed forward phase accumulation rate of said stream of said first timestamp values.

8. The method of Claim 1 further comprising the step of releasing said transport  
10 packets from a buffer responsive to said stable rate timing signal stream with a constant interval between said transport packets.

9. The method of Claim 1 further comprising the steps of providing said stable rate timing signal stream to a interval timer, and providing a constant interval between  
15 said transport packets based upon expiration of said interval timer when releasing said transport packets from a buffer.

10. The method of Claim 1 further comprising the step of maintaining successive diminishing counts decremented responsively to said stable rate timing  
20 signal stream.

11. The method of Claim 1 further comprising the step of generating second timestamp values responsive to said stable rate timing signal stream for replacing said first timestamp values.

25

12. The method of Claim 1 wherein said variable rate timing signal stream is generated in a type II phase locked loop and said stable rate timing signal is generated in a type I phase locked loop.

13. The method of Claim 1 wherein the transport packets convey Motion Picture Experts Group (MPEG) data and the first timestamp values are Program Clock Reference (PCR) values.

5        14. A system for guaranteeing an upper bound on output jitter while maintaining maximum loop bandwidth, said system comprising:

a plurality of transport packets wherein each of at least a portion of said plurality of transport packets includes a first timestamp value therein;

      a buffer for storing said plurality of transport packets;

10        a first loop for receiving a stream of first timestamp values and generating a variable rate timing signal stream conveying a variation rate and a phase accumulation rate of said first timestamp values to said first loop; and

      a second loop for receiving said variable rate timing signal stream and generating a stable rate timing signal stream conveying the average rate of said variable rate timing signal stream.

15        15. The system of Claim 14 further comprising a interval timer responsive to said stable rate timing signal stream to release said transport packets from said buffer such that said interval timer provides a constant interval between said transport packets based upon expiration of said interval timer.

20        16. The system of Claim 14 wherein said stable rate timing signal stream is responsive to said phase accumulation rate being feed forward from said first loop to said second loop.

25

      17. The system of Claim 14 wherein said second loop is limited by a slew rate limiter outside of said second loop.

18. The system of Claim 14 further comprising a slew rate limiter outside of said second loop to limit said stable rate timing signal stream as a result of feeding forward said phase accumulation rate of said stream of said first timestamp values.

5        19. The system of Claim 14 further comprising second timestamp values to replace said first timestamp values generated in response to generating said stable rate timing signal stream.

10      20. The system of Claim 14 wherein said variable rate timing signal stream is generated by a voltage controlled oscillator in a type I phase locked loop and said stable rate timing signal stream is generated by a voltage controlled oscillator in a type II phase locked loop.

15

20